

Virginia City Hybrid Energy Center
Response to Data Request
Hullihen Moore, Virginia Air Pollution Control Board

Question (Page No. 1):

For sulfur, ash, and each of the hazardous air pollutants identified by EPA as emitted in substantial quantities by EPA in its MACT rulemaking process (“substance(s)”) – A. Provide the average content of each substance in the coal burned by each boiler for each EGU in Virginia for the years 2005, 2006, and 2007. Also, provide the range of the content for each substance; for example average Sulfur content for a year may be 1%, but Sulfur content ranged from .9% to 1.1% or ash content might average 6%, but range from 4% to 8%. B. Provide the average content of each substance in the coal burned by all Virginia EGUs combined for the years 2005, 2006, and 2007. The averages should be calculated two different ways as follows: simple average giving equal weight to each boiler; weight average based on the tons burned.

Response:

Attachment 1 includes spreadsheets that address the request with data that is available to us, which consists of units operated in Virginia by Dominion. Electric generating units (EGU) are not typically required to submit coal testing data for hazardous air pollutant (HAP) constituents. As such, this data is not available. The percent sulfur, percent ash, and tons of coal consumed are parameters that have been reported to DEQ on Annual Emission Inventory Statements (EIS). The HCl and Hg emission factors were the basis for emissions reported to DEQ for EIS. It is important to note that the percent ash values are for washed coal because the units in the spreadsheet are PC boilers. The coal mercury content listed is typically based on best available information (EPRI or EPA emission factors) and not specific test data from the coal consumed.

Short-term emissions provided are either from stack test results, or calculated as $(\text{tpy} \times 2000) / (\text{mmBtu for year})$ or as $(\text{tpy} \times 2000) / (\text{hours for year})$. Annual mmBtu values for non-Dominion facilities were obtained from the 2006 Acid Rain Database, where available.

ATTACHME T 1

2005											As. Content (avg.)	Lead content (avg.)	Cadmium Content (avg.)	HF content (avg.)
Facility	Boiler	Tons Coal Burned	%A avg.	%A range	HCl content (avg.)	Mercury content (avg.)	Origin of Mercury Content Value	%S avg.	%S range					
Dominion - Altavista	U1	88,858	11.06	9.05-15.11	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.9	0.78-1.01					
	U2	90,154	11.06	9.05-15.11	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.9	0.78-1.01					
Dominion - Brema	U3	192,034	12.14	9.44-13.46	*	0.15 ppm	EPA 1999 ICR (EPR)	0.89	0.69-1.58					
	U4	439,051	12.3	11.7-13.79	*	0.15 ppm	EPA 1999 ICR (EPR)	0.85	0.69-1.3					
Dominion - Chesterfield	U3	255,354	10.11	9.55-10.5	*	0.11 ppm	EPA 1999 ICR (EPR)	1.11	0.97-1.26					
	U4	445,222	10.31	9.74-10.69	*	0.11 ppm	EPA 1999 ICR (EPR)	1.14	0.97-1.26					
	U5	775,418	10.32	9.86-10.77	*	0.11 ppm	EPA 1999 ICR (EPR)	1.15	1.01-1.25					
	U6	1,761,535	9.19	9.75-10.47	*	0.11 ppm	EPA 1999 ICR (EPR)	1.16	0.98-1.27					
Dominion - Chesapeake	U1	270,545	9.72	8.36-12.12	*	0.09 ppm	EPA 1999 ICR (EPR)	0.74	0.47-1.05					
	U2	280,639	10.61	8.4-12.18	*	0.09 ppm	EPA 1999 ICR (EPR)	0.75	0.46-1.05					
	U3	429,189	10.62	8.31-12.2	*	0.09 ppm	EPA 1999 ICR (EPR)	0.83	0.41-1.05					
	U4	150,197	10.74	8.98-12.39	*	0.09 ppm	EPA 1999 ICR (EPR)	0.84	0.5-1.05					
Dominion - Clover	U1	1,318,738	9.76	9.25-11.17	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	0.96	0.93-1					
	U2	1,222,269	10.32	9.25-14.1	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	0.98	0.93-1.13					
Dominion - Hopewell	U1	0	0	0	0	0.00 ppm		0	0					
	U2	0	0	0	0	0.00 ppm		0	0					
Dominion - Mecklenburg	U1	197,661	8.85	6.92-10.17	*	0.12 ppm	2000 Stack Test	1.24	1.04-1.26					
	U2	184,141	8.81	6.92-10.17	*	0.12 ppm	EPA 1999 ICR (EPR)	1.18	1.04-1.26					
Dominion - Southampton	U1	94,515	12.34	8.8-15.4	2.8 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.82	0.8-1.2					
	U2	94,832	12.34	8.8-15.4	2.8 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.82	0.8-1.2					
Dominion - Yorktown	U1	404,512	9.6	8.2-10.51	*	0.12 ppm	EPA 1999 ICR (EPR)	1.36	1.24-1.49					
	U2	432,660	9.58	8.05-10.44	*	0.12 ppm	EPA 1999 ICR (EPR)	1.36	1.21-1.47					
Cogentrix - Portsmouth	U1	62546.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
	U2	66962.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
	U3	64877.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
	U4	67789.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
	U5	66690.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
	U6	66213.0	8.09	n/a	1.2 lb/ton	2.5 E -4 lb/ton	VA DEQ EIS Report	0.73	n/a					
Birchwood Power Partners, L.P.	U1	664060	10.4	n/a	0.009609 lb/ton	6.475E-6 lb/ton	VA DEQ EIS Report	0.74	n/a					
Spruance Genco, LLC	U1	212106.0	8.48	n/a	0.09598 lb/ton	8.212 E -5 lb/ton	VA DEQ EIS Report	0.86	n/a					
	U2	212822.0	8.48	n/a	0.08739 lb/ton	8.7162 E -5 lb/ton	VA DEQ EIS Report	0.86	n/a					
	U3	226903.0	8.48	n/a	0.07166 lb/ton	7.783 E -5 lb/ton	VA DEQ EIS Report	0.86	n/a					
	U4	219083.0	8.48	n/a	0.07093 lb/ton	8.5081 E -5 lb/ton	VA DEQ EIS Report	0.86	n/a					
James River Cogen	U1	203174.0	8.46	n/a	1.2 lb/ton	8.3032 E -5 lb/ton	VA DEQ EIS Report	0.9	n/a					
	U2	203305.0	8.46	n/a	1.2 lb/ton	8.2979 E -5 lb/ton	VA DEQ EIS Report	0.9	n/a					
AEP - Glen Lyn	U5	165956	10.8	n/a	1.23 lb/ton	8.0 E -5 lb/ton	VA DEQ EIS Report	0.89	n/a					
	U6	503511	10.4	n/a	1.223 lb/ton	8.0 E -5 lb/ton	VA DEQ EIS Report	0.9	n/a					
AEP - Clinch River	U1	558251.0	13.590	n/a	1.223 lb/ton	9.152 E-5 lb/ton	VA DEQ EIS Report	.870	n/a					
	U2	520872.0	13.620	n/a	1.221 lb/ton	9.152 E-5 lb/ton	VA DEQ EIS Report	.880	n/a					
	U3	513202.0	13.620	n/a	1.22 lb/ton	9.111 E -5 lb/ton	VA DEQ EIS Report	.860	n/a					
Potomac River Gen. Station	u1	141530.0	8.5	n/a	1.2 lb/ton	Not available	n/a	0.85	n/a					
	u2	107217.0	8.5	n/a	1.2 lb/ton	Not available	n/a	0.85	n/a					
	u3	117738.0	8.5	n/a	1.2 lb/ton	Not available	n/a	0.85	n/a					
	u4	108295.0	8.5	n/a	1.2 lb/ton	Not available	n/a	0.85	n/a					
	u5	117581.0	8.5	n/a	1.2 lb/ton	Not available	n/a	0.85	n/a					

Except as specifically noted below, all listed Title V permits require, at a maximum, fuel content records for coal sulfur, ash and heat value. Arsenic, Lead, Cadmium and Fluorides are not part of the usual coal analysis, as AP-42 or F-factors are used in compliance calculations. Exceptions include: Spruance Genco is required to have stack tests (not coal analysis) results for Be, sulfuric acid mist, mercury, and formaldehyde; Mirant is required to have stack tests (not coal analysis) for HCl and HF. Such stack tests for non-Dominion facilities are not available at this time.

* indicates AP-42 factor of 1.2 lb/ton is used for HCl emissions reporting calculations (no stack tests are available at this time)

** %S, %A, tons of coal as reported to DEQ on Annual Emission Inventory Statements (EIS). HCl and Hg emissions calculated from emissions reported to DEQ for EIS.

2006											As. Content (avg.)	Lead content (avg.)	Cadmium Content (avg.)	HF content (avg.)
Facility	Boiler	Tons Coal Burned	%A avg.	%A range	HCl content (avg).	Mercury content (avg).	Origin of Mercury Content Value	%S avg.	%S range					
Dominion - Altavista	U1	82,238	10.12	8.65-11.79	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.89	0.66-1.12					
	U2	78,915	10.12	8.65-11.79	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.89	0.66-1.12					
Dominion - Brema	U3	178,937	12.18	11.71-12.83	*	0.15 ppm	EPA 1999 ICR (EPR)	0.95	0.76-1.06					
	U4	446,697	12.12	11.71-12.83	*	0.15 ppm	EPA 1999 ICR (EPR)	0.97	0.76-1.06					
Dominion - Chesterfield	U3	178,763	10.03	9.22-11.32	*	0.11 ppm	EPA 1999 ICR (EPR)	1.15	1.01-1.27					
	U4	336,374	10.05	9.22-11.32	*	0.11 ppm	EPA 1999 ICR (EPR)	1.16	1.05-1.51					
	U5	804,490	10.06	9.22-11.32	*	0.11 ppm	EPA 1999 ICR (EPR)	1.16	1.05-1.27					
	U6	1,631,741	10.08	9.22-11.32	*	0.11 ppm	EPA 1999 ICR (EPR)	1.15	1.05-1.27					
Dominion - Chesapeake	U1	263,733	11.74	10.62-12.58	*	0.09 ppm	EPA 1999 ICR (EPR)	0.75	0.63-0.93					
	U2	270,475	11.74	10.53-12.55	*	0.09 ppm	EPA 1999 ICR (EPR)	0.76	0.63-0.94					
	U3	439,680	9.87	9.96-11.85	*	0.09 ppm	EPA 1999 ICR (EPR)	0.99	0.87-1.27					
	U4	534,635	8.99	9.93-11.72	*	0.09 ppm	EPA 1999 ICR (EPR)	0.98	0.86-1.3					
Dominion - Clover	U1	1,408,084	10.69	9.3-12.16	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	1.02	0.93-1.13					
	U2	1,397,013	10.01	9.25-12.16	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	0.99	0.93-1.13					
Dominion - Hopewell	U1	0	0	0	0	0	AP-42, Table 1.1-16, 5th Ed 9/98	0	0					
	U2	0	0	0	0	0	AP-42, Table 1.1-16, 5th Ed 9/98	0	0					
Dominion - Mecklenburg	U1	168,524	10	8.48-12.85	*	0.12 ppm	2000 Stack Test	1.11	0.85-1.2					
	U2	168,704	10	8.48-12.85	*	0.12 ppm	2000 Stack Test	1.1	0.85-1.2					
Dominion - Southampton	U1	81,105	11.29	9.9-13.9	2.8 lb Cl/ton	0.09 ppm	EPA 1999 ICR (EPR)	0.85	0.7-1.0					
	U2	80,623	11.29	9.9-13.9	2.8 lb Cl/ton	0.09 ppm	EPA 1999 ICR (EPR)	0.85	0.7-1.0					
Dominion - Yorktown	U1	389,560	8.55	7.55-9.96	*	0.12 ppm	EPA 1999 ICR (EPR)	1.39	1.17-1.46					
	U2	386,591	8.63	7.56-9.53	*	0.12 ppm	EPA 1999 ICR (EPR)	1.39	1.19-1.53					
Cogentrix - Portsmouth	U1	64962.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
	U2	62551.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
	U3	67714.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
	U4	65548.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
	U5	62623.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
	U6	65222.0	8.390	n/a	1.2 lb/ton	n/a	n/a	.840	n/a					
Birchwood Power Partners, L P	U1	503606	10.2	n/a	.00701 lb/ton	8.425E-5 lb/ton	VA DEQ EIS Report	0.82	n/a					
Spruance Genco, LLC	U1	177183.0	8.8	n/a	0.1111 lb/ton	9.83 E -5 lb/ton	VA DEQ EIS Report	0.83	n/a					
	U2	169827.0	8.8	n/a	0.1095 lb/ton	1.09 E -4 lb/ton	VA DEQ EIS Report	0.83	n/a					
	U3	184525.0	8.8	n/a	0.0910 lb/ton	9.57 E -5 lb/ton	VA DEQ EIS Report	0.83	n/a					
	U4	181437.0	8.8	n/a	0.0959 lb/ton	1.02 E -4 lb/ton	VA DEQ EIS Report	0.83	n/a					
James River Cogen	U1	189335.0	8.46	n/a	1.2 lb/ton	8.91 E -5 lb/ton	VA DEQ EIS Report	.90	n/a					
	U2	192688.0	8.46	n/a	1.2 lb/ton	8.75 E -5 lb/ton	VA DEQ EIS Report	.90	n/a					
AEP - Glen Lyn	U5	177131.0	10.58	n/a	1.228 lb/ton	8.0 E -5 lb/ton	VA DEQ EIS Report	0.92	n/a					
	U6	524850.0	10.94	n/a	1.214 lb/ton	8.0 E -5 lb/ton	VA DEQ EIS Report	0.92	n/a					
AEP - Clinch River	U1	499109.0	13.580	n/a	1.223 lb/ton	n/a	n/a	0.88	n/a					
	U2	551081.0	13.570	n/a	1.22 lb/ton	n/a	n/a	0.88	n/a					
	U3	596407.0	13.570	n/a	1.225 lb/ton	n/a	n/a	0.88	n/a					
Potomac River Gen. Station	u1	59821.0	8.5	n/a	0.0367 lb/ton	2.82 E -04 lb/ton	VA DEQ EIS Report	0.85	n/a					
	u2	56981.0	8.5	n/a	0.032 lb/ton	2.02 E -4 lb/ton	VA DEQ EIS Report	0.85	n/a					
	u3	114939.0	8.5	n/a	0.0302 lb/ton	1.11 E -4 lb/ton	VA DEQ EIS Report	0.85	n/a					
	u4	144517.0	8.5	n/a	0.0322 lb/ton	8.14 E -5 lb/ton	VA DEQ EIS Report	0.85	n/a					
	u5	126987.0	8.5	n/a	0.0311 lb/ton	1.04 E -4 lb/ton	VA DEQ EIS Report	0.85	n/a					

Except as specifically noted below, all listed Title V permits require, at a maximum, fuel content records for coal sulfur, ash and heat value. Arsenic, Lead, Cadmium and Fluorides are not part of the usual coal analysis, as AP-42 or F-factors are used in compliance calculations. Exceptions include: Spruance Genco is required to have stack tests (not coal analysis) results for Be, sulfuric acid mist, mercury, and formaldehyde; Mirant is required to have stack tests (not coal analysis) for HCl and HF. Such stack tests for non-Dominion facilities are not available at this time.

* indicates AP-42 factor of 1.2 lb/ton is used for HCl emissions reporting calculations (no stack tests are available at this time)

** %S, %A, tons of coal as reported to DEQ on Annual Emission Inventory Statements (EIS). HCl and Hg emissions calculated from emissions reported to DEQ for EIS.

2007											As. Content (avg.)	Lead content (avg.)	Cadmium Content (avg.)	HF content (avg.)
Facility	Boiler	Tons Coal Burned	%A avg.	%A range	HCl content (avg.)	Mercury content (avg.)	Origin of Mercury Content Value	%S avg.	%S range					
Dominion - Altavista	U1	77,657	10.24	7.62-12.03	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.76	0.65-0.83					
	U2	75,007	10.24	7.62-12.03	3.14 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.76	0.65-0.83					
Dominion - Brems	U3	208,921	11.26	10.67-11.81	*	0.15 ppm	EPA 1999 ICR (EPR)	0.88	0.81-1.0					
	U4	435,580	11.26	10.67-11.81	*	0.15 ppm	EPA 1999 ICR (EPR)	0.85	0.81-1.0					
Dominion - Chesterfield	U3	228,378	9.45	8.68-10.66	*	0.11 ppm	EPA 1999 ICR (EPR)	1.15	1.12-1.2					
	U4	370,142	9.54	8.68-10.66	*	0.11 ppm	EPA 1999 ICR (EPR)	1.15	1.08-1.2					
	U5	936,009	9.64	8.68-10.66	*	0.11 ppm	EPA 1999 ICR (EPR)	1.14	1.02-1.2					
	U6	1,707,143	9.55	8.68-10.66	*	0.11 ppm	EPA 1999 ICR (EPR)	1.14	1.02-1.2					
Dominion - Chesapeake	U1	331,766	7.21	6.41-8.41	*	0.09 ppm	EPA 1999 ICR (EPR)	0.53	0.47-0.76					
	U2	333,342	7.23	6.41-8.42	*	0.09 ppm	EPA 1999 ICR (EPR)	0.53	0.47-0.76					
	U3	401,120	7.67	6.4-10.83	*	0.09 ppm	EPA 1999 ICR (EPR)	0.61	0.47-1.14					
	U4	616,732	7.62	6.4-10.83	*	0.09 ppm	EPA 1999 ICR (EPR)	0.6	0.47-1.14					
Dominion - Clover	U1	1,339,763	10.41	9.28-11.22	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	0.98	0.93-1.1					
	U2	1,331,824	9.94	9.25-11.22	2,404E-4 lb/mmBtu	0.10 ppm	coal x tons coal x Hg stack test	1.01	0.93-1.1					
Dominion - Hopewell	U1	155,264	11.55	11.39-11.84	2.6 lb/ton	0.09 ppm	curry Guidance Aug 2001 (%Hg in coal)	0.85	0.81-0.98					
	U2	152,464	11.55	11.39-11.84	2.6 lb/ton	0.09 ppm	curry Guidance Aug 2001 (%Hg in coal)	0.85	0.81-0.98					
Dominion - Mecklenburg	U1	173,354	9.02	9.1-10.78	*	0.12 ppm	2000 Stack Test	1	0.84-1.12					
	U2	170,702	8.98	9.1-10.78	*	0.12 ppm	2000 Stack Test	1.01	0.84-1.12					
Dominion - Southampton	U1	105,098	11.59	10.5-12.3	2.8 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.86	0.8-0.9					
	U2	98,018	11.59	10.5-12.3	2.8 lb Cl/ton	0.12 ppm	EPA 1999 ICR (EPR)	0.86	0.8-0.9					
Dominion - Yorktown	U1	419,154	7.83	7.86-9.46	*	0.12 ppm	EPA 1999 ICR (EPR)	1.26	1.13-1.37					
	U2	383,515	7.79	7.99-10.15	*	0.12 ppm	EPA 1999 ICR (EPR)	1.25	1.07-1.37					
Cogentrix - Portsmouth	U1	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U2	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U3	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U4	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U5	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U6	Not Available	NA	NA	NA	NA	NA	NA	NA					
Birchwood Power Partners, L.P.	U1	Not Available	NA	NA	NA	NA	NA	NA	NA					
Spruance Genco, LLC	U1	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U2	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U3	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U4	Not Available	NA	NA	NA	NA	NA	NA	NA					
James River Coagen	U1	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U2	Not Available	NA	NA	NA	NA	NA	NA	NA					
AEP - Glen Lyn	U5	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U6	Not Available	NA	NA	NA	NA	NA	NA	NA					
AEP - Clinch River	U1	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U2	Not Available	NA	NA	NA	NA	NA	NA	NA					
	U3	Not Available	NA	NA	NA	NA	NA	NA	NA					
Potomac River Gen. Station	U1-U5	Not Available	NA	NA	NA	NA	NA	NA	NA					

Except as specifically noted below, all listed Title V permits require, at a maximum, fuel content records for coal sulfur, ash and heat value. Arsenic, Lead, Cadmium and Fluorides are not part of the usual coal analysis, as AP-42 or F-factors are used in compliance calculations. Exceptions include: Spruance Genco is required to have stack tests (not coal analysis) results for Be, sulfuric acid mist, mercury, and formaldehyde; Mirant is required to have stack tests (not coal analysis) for HCl and HF. Such stack tests for non-Dominion facilities are not available at this time.

Note: 2007 Annual Emissions data (throughputs and coal analysis) are not available from DEQ at this time.

* indicates AP-42 factor of 1.2 lb/ton is used for HCl emissions reporting calculations (no stack tests are available at this time)

** %S, %A, tons of coal as reported to DEQ on Annual Emission Inventory Statements (EIS). HCl and Hg emissions calculated from emissions reported to DEQ for EIS.

Simple Average 2005-2007 (average of all EGUs for all three years)	% A Avg.	% S Avg.	HCl content (avg.)	Mercury content (avg.)
	9.47	0.89	1.27 lb/ton	0.09 ppm
Weighted Average 2005-2007 (average of each boiler, weighted by tons coal, for all EGUs for all three years)	% A Avg.	% S Avg.	HCl content (avg.)	Mercury content (avg.)
	10.41	1.01	0.91 lb/ton	0.09 ppm